Cultural and Language-based Conceptual Innovation Issues and Impacts on Technological Innovations

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Introduction

A substantial amount of literature that corroborates the impact of some type of culture as a barrier to innovation is provided and it is found that researchers concur on the thesis that a good culture–i.e. appropriately configured for innovation-, whether, organizational, national, regional, sectoral, or multi-national is needed in order to create an environment that is conducive to technological and other types of innovations. Though this diagnosis has been made, to the best knowledge of the authors, there is hardly any empirical studies done to prove whether the diagnosis is correct or not. It is then concluded, that there needs to be more empirical evidence brought forth to prove this hypothesis beyond reasonable doubt.

In the light of what has been mentioned, the focus of the paper changes to literature that provides models for those who wish to do empirical research with regard to how language and culture can be used when an individual, nation, region, or an organization aspires to be innovative. A closer look at the specific aspects of language and culture that might be more responsible for their (language and culture) impacts becomes necessary. Therefore in this paper, literature that corroborates and that which refutes our hypothesis has been sourced from various fields including the following: general psychology, industrial psychology, engineering psychology, community psychology, philosophy, cognitive science, brain sciences, systems research, behavioral science, anthropology, language and human evolution, psycholinguistics, neuroscience of language, child language acquisition, human language processing, development of inflection, heredity, innovation issues, creativity management and various cultural studies. The reason for scanning across this broad spectrum of fields was not only motivated by the desire to gain various insights and perspectives, but also so that perhaps the link could be found that could eventually lead to a break through in this study which has been tried by some researchers in the 60s and well into the 90s. These researchers (MacKinnon, 1960,1962, Mednick, 1962, Woodman *et al.*, 1993, Amabile, 1996,1997) did research from a psychology perspective. The authors of this paper, who have an engineering background, have sought to come up with a conceptual and testable model that could be utilized for the enhancement of technological innovations especially in lands where it is mostly lacking by studying the language and cultural traits that characterize the most technologically innovative nations and their organizations. Another aim of the discussion from these backgrounds is to elucidate those aspects of culture and language that are unique to certain individuals, nations and organizations, and then evaluate whether they potentially promote or stifle innovation.

This paper acknowledges that it is both generally accepted and proven that languages and culture are not static due to trends, environmental and psychological factors and that their dynamic nature could make it difficult for researchers to conclude on their uniqueness to certain individuals, nations and organizations. Paradoxically, there are also some radical

arguments from authors in the field of behaviorism who argue that if it is the environmental and biological processes that initiate creativity in a person or organization, then credit must go to these forces and processes and not to any individual or nation. This is because a person is regarded merely as a locus in which certain genetic and environmental causes come together to produce something, pretty much the same way that a hen lays an egg and we do not call the hen creative or innovative. This being the case, literature that separates endogenous aspects from exogenous ones is discussed so that there will be no equivocation about what is portable and belonging to phenotype (derived from culture and environment) and that which 'runs through the blood' (the genotype –bearing in mind that over an extended period of generations even the genotype can also be modified as evidenced in this paper). This is done, so that the unique characteristics that enable an individual, nation, or organization to be more innovative than others will eventually be elicited.

When discussing literature on language in relation to innovation and creativity, this paper considers literature that answers questions such as: Is it in the way they speak –the kind of influence the words they choose to use have- or is it in the way the language itself is structured (morphology and mental lexicons)? Does the way the language is structured encourage more use of the left hermisphere of the brain or the right hermisphere, and what impact does this have in a person? Is a person who uses more of the right hermisphere (synthesis)- due to the way his language is structured- more creative and therefore innovative than the one who uses more of the left hermisphere (analysis and logic)? Or does it not matter since the two hermispheres co-operate and collaborate anyway according to recent research?

Towards the conclusion, a theoretical framework for both: diagnosing the language and cultural behavior that is counter productive in the context of innovation and predicting whether innovations will be successful or not, is provided. Case studies are provided from literature to enhance the likelihood of the correctness of the diagnosis and predictions. Another framework for testing language and cultural aspects as well as types of behavior that are deemed necessary for the inculcation of the correct language use or structure and culture for the enabling environment for innovation to be realized, is given and it is derived from the indicators emanating from the work done by other researchers to date.

An overview of the selected contextual meaning of technological innovation

There are numerous definitions on innovation from innovation literature. According to Narayanan (2001), the word innovation seems to be having its origins in the Latin *innovare*, meaning "to renew, to make new, or to alter". Some researchers define innovation in the context of pure technological developments and others consider innovations from an economical angle, for example as the first business application of the invention (see Schumpeter, 1950; Cooper, 1983; Moss Kanter, 1984; Pérez-Bustamante, 1999; Poolton and Ismail, 2000; Narayanan, 2001; Davison, 2005; Dikmen, Birgonul and Artuk, 2005). These definitions are mostly about the first implementation of an idea that is, or at least perceived to be, new ; and then executed, often assiduously, and in a way that leads to a broad-based extrinsic recognition to an individual, nation, organization or

multi-national organization. Furthermore, it is generally understood that, the emphasis is not so much on newness of the idea than it is on the relevance of the novel idea to its unit of adoption (Aitken and Hage, 1971; Hage and Dewar, 1973; Rogers, 1983; Rogers1995). It then becomes necessary to look at the adoption of a new idea so that it will be a real innovation. Man (2001) states, "…- ideas are insufficient, only the successful implementation of those ideas can be regarded as true innovation", and this successful implementation depends on the adoption of the innovation by potential users.

Cultural Issues in Technological Innovations

Wide-ranging research on various types of mores has been done. These types include the following: family culture, national culture, organizational culture, universal culture, generalized culture and particular culture. In cultural anthropology, the anthropologists study society and culture from two perspectives. These are: ethnography and ethnology. All these types of cultures are interrelated. Between different individuals, nations, organizations there are cultural differences, and this is viewed as cultural diversity. Many researchers agree that cultural diversity is not necessarily an appalling phenomenon, but it must be appropriately managed so that we derive value from it. On the subject of managing cultural diversities, (Miroshnik, 2002) alludes to three types of what she calls "common responses to cultural differences as strategies to manage cultural diversities…". These types are:

- Parochial – "our way is [the] only way".
- Ethnocentric- "Our way is the best way"
- Synergistic – "Our way and their way differ, but neither is inherently superior to the other".

The synergistic type is deemed as an apt attitude for managing cultural diversity by Miroshnik (2002).

Diversity is considered to be an advantage when creating a new idea. It is also generally accepted by many researchers and managers that multicultural organizations are more flexible and open to new ideas. Adler (1983a), discusses about the understanding that multicultural organizations are better configured for the understanding of customer's needs. When confronted with a complex problem, group thinking seems to provide the advantage of enhanced creativity, flexibility, and problem solving skills that would be a daunting exercise and experience for one person. In group thinking there is a blend of perspectives emanating from a fusion of cultural and other backgrounds. Furthermore, Adler (1983a) admonishes that cultural diversity should not be made a liability to the organization, and that instead it should be recourse for problem solving. Another interesting dynamic about culture is that it is not static. The patterns of individual and group behavior keep changing and this phenomenon has an influence on the society's culture (see Adler, 1983a). This makes it especially difficult for managers who are pro convergent processes.

Various authors have coined numerous definitions about what culture is. They all seem to agree essentially, though they sometimes use different words. Basically, "culture is the way of life" (Foster, 1962). Tylor (1977) states that, "Culture is that complex whole

which includes knowledge, belief, art, law, morals, customs and any capabilities and habits acquired by a man as a member of society".

The more recent definitions that the authors came across are all based on the same thinking as the ones demonstrated by the definitions given here. In other words they are all about, "the collective programming of the mind which distinguishes the members of one human group from another…the interactive aggregate of common characteristics that influences a group's response to its environment" (Hofstede, 1980, cited by Miroshnik, 2002). Finally, "Cultures are integrated, patterned systems: when one custom, belief, or value changes, others change as well" (Kottak, 1991).

Against the background provided by the preceding discussion on the contextual understanding and definitions of culture, an attempt to demonstrate those aspects of culture that could promote technological innovations is going to be made. As mentioned in the introduction, many researchers have identified certain cultural traits that impede the process of innovation. Moreover, they have also speculated on the correct configurations of culture so that it will be conducive for technological innovations with very little empirical evidence on successful experiments. Little attention is going to be made to the disadvantages of culture in technological innovations and more attention will be on the advantages of culture in technological innovations.

The discussion that follows is placed in the context of the understanding that various types of culture are interrelated, for example, -an organizational culture is made up of national cultures that are made up of regional cultures that are made up of family cultures that are made up of individuals, and also that some cultures are universal, and/or generalized and also/or particular. In view of this understanding, this paper will therefore not separate the various types during the discussion. In other words it does not matter what the type is, as long as it gives some indicators about a cultural trait that is conducive to creativity and innovation.

It is generally agreed by many researchers that organizational culture plays a significant role in determining the degree to which creativity and innovation are promoted and stimulated in an organization (Pech and Slade, 2004; Martins and Terblanche, 2003; Knox, 2002; Miroshnik, 2002; Cameron and Quinn, 1999; Ahmed, 1998; Tushman and O'Reilly, 1997; Syrett and Lammiman, 1997; Robbins, 1996; Dunphy and Herbig, 1994; Pheysey,1993; Shaughnessy, 1988; Schuster, 1986; Rothwell & Wisseman, 1986).

There is a general understanding that is promulgated by all these researchers. It is that a culture that does not allow divergent thinking, stifles innovation (see also Paulus, 2000; McCrae, 1987). It appears that certain cultures are more welcoming to new ideas, and this necessarily also depends on whether there is shared meaning during conversations or not. A common culture would be ideal for meaning making during a discourse, as it would enable communicators to understand both the tacit and explicit meanings of the language used. This view is corroborated by Herskovits (1989) who, cited by Miroshnik (2002), states, "Language is probably the most difficult cultural element that a global manager

must study, because it is more than the ability to speak a foreign language, but also the competency to recognize idiomatic interpretations".

This then brings us to the question of language. Does shared language make it easier for those who are sharing ideas to better understand one another, than would be the case had the language not been common? If yes, would this continue to be helpful towards the articulation of new ideas, even if the culture is conservative and restrictive? Man (2001) states, " … language used is vital in opening the side of the brain that begins innovative inquiries". Even so, the understanding by the authors is that, it still seems that language and culture are intrinsically linked. People use language to express their culture, and culture also determines how people will use their language. Miroshnik (2002) states: "Culture enables us to communicate with others through a language that we have learned and that we share in common". The authors' view is not that one is embedded within another, but that they influence each other notwithstanding the fact that one would suffer without the other. Following, is an attempt to define language as it is understood in this thesis. Singling it out is not motivated by the thinking that it exists and potentially can lead to innovation alone, regardless of the cultural configuration, but by the desire to contextualize it for the purpose of clarity in this paper.

Language Issues in Technological Innovations

In view of the understanding that linguists, philosophers, anthropologists and psychologists have done a great deal of research on language, it is felt that for the purpose of this paper it will suffice just to consider those aspects of language and its definition that seem more relatable to the current inquiry. It would be outside the scope of this discourse to cover the entire breadth and depth of this topic (language) hence the decision to draw eclectically from the various fields of inquiry with the intent of detecting strong indicators that could be rewarding in the current expedition through literature. Particular attention is paid to the links between language and intelligence, intelligence and inventiveness, inventiveness and cognitive skills, as well as whether or not there is any correlation between intelligence and innovation.

An overview and definition

For some time it was believed that language abilities were inputs and learning from the environment and other sources. In this context, it makes sense to find the languages that would trigger innovativeness better than others. With the arrival of Chomsky's (1959) theory of innate language acquisition device, there was a major shift in thinking. Now, language could never be thought of as a tool for thought but rather as a tool that attempts to explain thought. In other words thinking does take place without the language.

This therefore refutes the understanding that language defines how we see the world. Language seems to be merely a tool, though insufficient in some respects, that we use to a limited extent to describe our thoughts. The thinking or innovative ability of someone cannot be ascertained only through the language he uses. According to Vernon (1967), deaf children with limited verbal language ability score in the normal range on standardized tests of cognitive performance. Moreover, Furth (1971) states that the cognitive skills and thinking abilities of the deaf children develop relatively normally.

Perhaps what these studies did not look at, is whether or not these children were using non-verbal forms of language for their thinking which are derived from the innate human program for language. For a long time the study of language has largely been the domain of linguists (see Gross, 2001). Linguists tend to define language in terms of its structure (its grammar). A new trend in the study of language has recently developed. This trend is about looking at language both from the perspective of linguists and that of psychologists,- psycholinguistics. This includes the study of: perception, understanding, and production of language, as well as with their development.

"The normal use of language is innovative, in the sense that much of what we say in the course of normal language use is entirely new [and] not a repetition of anything that we have heard before" (Chomsky, 1968). If this is true, then at least, it means that all human beings have an element of creativity. Could this also mean that someone who has good language skills is also good in creativity? An interesting phenomenon here would be to know whether this creativity (or innovation) is translatable into technological innovations. It has already been discussed, that innovation is about new ideas and that this new ideas are communicated to others through language. Moreover, it has also been stated that a common language is vital in meaning making and technology transfer. There seems to be clear evidence that language is useful for the communication of new ideas which could lead to innovations, but still it would be of interest to know whether or not some languages are better than others in the communication of new ideas. Psycholinguists have done some work on language and thinking.

The view of the authors is that language is more than just a convenient set of symbols for the communication of our thoughts. This view is supported by a linguist by the name of Benjamin L Whorf (1956) who argues that higher levels of thinking require language and that the characteristics of a particular language shape the ways that the users of the language think about things. In the hypothesis of *linguistic relativity*, the view is that the particular language that people speak determines how they will see the world. It seems that the level of precision in thinking about something depends on the relevance of the phenomenon to the thinker, otherwise, why would he bother. Someone, for example, who lives near the north- pole will tend to have more words that describe snow than someone who lives in a different environment. In English for example, the word would be just snow, whereas the Eskimos are said to have four different words (see Morgan *et al*, 1986) or Inuit Eskimos have twenty different words (see Gross, 2001) for snow. This greater precision must not necessarily be attributed to flexibility of the language used by the Eskimos but to the demands and triggers of the environment.

The theory of *linguistic relativity* has recently come under attack due to the experiments that were done on color perception. It has been found that the fact that certain languages do not have names for certain colors does not mean that the people who use these languages cannot perceive those colors (see Rosch, 1973). Rosch (1973) did experiments with the Dani people of New Guinea who had only two focal-color names in their language, *mili* for black or dark and *mola* for white or bright. It was found that the thinking of the Dani people was influenced by even the focal colors for which they did not have names.

Initially the authors had sought out to investigate the relationship between language and thought. If for example, it was found that thought depends on language, it would then make sense to look at which language has which kind of influence on thought and then also look at its structure. However, research so far indicates that though language learning from the environment and other cultural sources seems to play a role in ones language development, it is not the only factor responsible for language development. This has been deduced from the experiments done with the primates for example such as chimpanzees where attempts to teach them human language were not impressively successful. At least, these experiments made researchers to believe that there must be some innate abilities in humans that some or other primates do not have.

It seems that the components of language structure such as, phonology, morphology, lexicons, semantics, and syntax require that innate ability of a human being to use. By themselves they cannot do much. Kottak (1991), an anthropologist, after a careful study on the various hypotheses on the relationship between language, thought and culture, offers the following conclusion, "According to the principle of **linguistic relativity,** all dialects are equally effective as systems of communication, which is language's main job. Our tendency to think of particular dialects as better or worse than others is a social rather than a linguistic judgement". After journeying through the following literature on language and thought: Watson's (1913) 'peripheralist approach'- that language and thought are the same, Sapir (1929) and Whorf (1956, a student of Sapir) in their *Sapir-Whorf linguistic relativity hyphothesis*, Brunner (1983) arguing that thought is dependent on, or caused by language, it was felt by the authors that the best way to conclude is by the following quotation from Gross (2001).

> While there are many examples indicating that thought can occur without language, the exact relationship between thought and language remains unclear. What is certain, however, is that no one account of this relationship is true and all others false; several theoretical perspectives can claim some support from the experimental literature. However, since language represents such a central feature of culture, both shaping it and being shaped by it, any theory which fails to take account of cultural factors is likely to be inadequate.

The authors feel that this discussion cannot be closed without also looking at the functioning of the brain and innovation. Though not many, there are some researchers, especially the neuropsychologists, who have offered some insights about the relationship between the brain hermispheres and innovation. Ornstein (1986) gives the following explanation about the major differences between the left and right hermispheres:

- The *left* is specialized for *analytical* and *logical thinking* (breaking things down into their component parts), especially in verbal and mathematical functions, processes information *sequentially*(one item at a time), and its mode of operation is primarily *linear* (straight line).

- The *right* is specialized for *synthetic* thinking (bringing different things together to form a whole), particularly in the area of spatial tasks, artistic activities, crafts body image and face recognition, processes information more *diffusely* (several items at once), and its mode of operation is much *less linear* (more holistic).

Though this explanation by Ornstein (1986) is widely accepted, it is argued by many that it is not as simple as saying some tasks are for one side of the brain and others for another side of the brain. It is argued that difference is only in the processing style, and therefore the two sides of the brain may work together on the same task and their different processing styles are complimentary in the process rather than anything else. Morgan *et al* (1986) concur with Ornstein (1986) by stating that, language understanding is usually the domain of the left hemisphere and that the right hemisphere is usually specialized to deal with spatial relationships, pattern recognition and images. Morgan *et al* (1986) also state that, "the specializations of the hemispheres are matters of degree. In this paper we therefore assert that it does appear that there is cooperation between the two hemispheres rather than that one hemisphere is solely responsible for particular tasks. Gross (2001) maintains that, "a 'smart' mind is one that responds in both ways" and he continues by quoting McCrone (1999) as saying, "…whatever the story about lateralization, simple dichotomies are out. It is how the two sides of the brain complement and combine that counts". Artists, composers, architects and so on are said to be right brained, and physicians, scientists, accountants and so on, are on the other hand said to be left brained. Certain atypical individuals, such as Leonardo da Vinci, are cogitated to be both right brained and left brained. This is why Morgan *et al* (1986) conclude by saying, "to be more conservative, we may simply say that there seems to be some hemispheric specialization of function".

Notwithstanding the trend in the discourse on the two hemispheres, Alder (1994) claims to be involved in the research that has managed to identify a few points. Harry Alder (1994) eulogizes Edward De Bono's (1977) Lateral Thinking as having been instrumental in explaining that each of us inherently is creative, but it is just a matter of releasing or stimulating that part of our brains that brings forth new perspectives, or the occasional "eureka". Alder's views are discussed in brief here below:

- We have enormous untapped resources of thinking power, as the right side of the brain, which is associated also with the subconscious- intuition, hunches and so on – is so underutilized in Western society.
- Our education systems major on logic (logic as we understand it with the left brain) rather than the feelings and spontaneous "insights" associated with the right side of the brain.

Based on the research with, and training they offer to, British business leaders, Alder (1994) highlights a few methods that work, when trying to evoke the right brain. Some of them are summarized here below:

- *Don't try too hard*- the right brain can do its best work when you are relaxed. The harder you try, or the more conscious you are of a problem, the harder it is to get a result.

- *Make space* – this is somewhat related to the previous one, in that it is also about finding time and space to relax. For, example in the research and discussions that were done with chairmen and chief executives of leading British companies, it was found that most important ideas came to them outside office hours, during times of relaxation and pleasure.
- *Sleight of Mouth*- this great skill of applying different perspectives to any problem comes with practice. In short this is about looking at a problem from many angles and coming up with metaphors for it and this will eventually unblock an intractable problem
- *Chunking*- "The process of chunking maintains some link with an original concept or issue, but introduces new associations; seeing things, if you like, both from a bird's eye and a worm's eye view, with many different vantage points. The randomness and subjectivity introduce the lateral thinking needed to open up an issue".

Other methods highlighted by Alder are; reversals, chunked reversals, metaphors, meta model and visualization. Alder again asserts that, "Our own more recent research shows that the whole range of right brain thinking attributes are a factor in top business leadership, and tend to separate the real leader from the manager. What is interesting is that in this same research by Alder, it is acknowledged that the secret is in the partnership with and the mutual respect for, the two different thinking processes during problem solving. This discussion is supported by John Man (2001) when he says that "technological growth is evident when:

- Brain or knowledge-based work increases;
- Body stress and strain is eliminated;
- Quality of work life is enhanced;
- Tangible savings are evident."

Moreover, Man (2001) argues that the language used is crucial to opening the side of the brain that triggers innovative inquiries. He then goes on to mention innovation triggers, including the language of the right brain.
If there was strong indication from the research on language and thinking that indeed, language alone is responsible for triggering new ideas in the brain during the thinking process, then it would be worth investigating deeper into the relationship between the hemispheres and language.

This paper concludes by asserting that it seems as if language is a component of culture and if it is viewed in the context of culture its influence on an individual's innovation will be clear, otherwise outside this context its relationship with innovation 'remains unclear'.

Conclusion

Hitherto, as evidenced in the preceding discussion, the authors have avoided nailing down and conclusively establishing a precisely formulated thesis, due to the fact that the hypotheses that were considered seem to be still in need of further investigation. However, for the purpose of this paper, a mixture of the various views has been considered from the angle of culture and the language within the culture. The '*nature*-

nurture' debates could also not be concluded. It is still not clear whether, naturally, certain individuals are born innovative, or through being nurtured appropriately just about anyone can be innovative. This is pretty much like the debate about whether entrepreneurs are born like that, or created by society. Thus-far the authors believe that, a consideration of both the nurturing and natural aspects of innovation is a safer angle of approach.

A more recent study on innovation and entrepreneurship views the role of language in the context of culture, but more specifically as a tool for the necessary discourse for triggering innovation (see Grant *et al*, 2001; Rigg, 2005; Checkland, 2000; Watson, 2000; Czarniaskwa, 1998; Woodilla, 1998). These researchers all emphasize the importance of 'talking' regardless of the language (at a technical and structural level). It is also generally agreed by them, that " Organizational discourse as a field of enquiry has been attracting increasing attention in recent years, but, …there are still very few empirical discursive analyses of organization and managing" (Rigg, 2005; see also Grant *et al*, 2001). These researchers are motivated by the constant play that they see between talk, meaning and action, both at the level of an individual as well as at the level of an organization (i.e. collectively). They also are interested in the discursive practices or resources used by managers when they persuade, encourage, cajole, and sometimes even coerce other members to adopt new working practices, - and in working out new solutions.

References

Adler, N.J. (1983a). Organizational development in a multicultural environment. *Journal of Applied Behavioral Science*, Vol. 19, No. 3, pp.349 -65.

Ahmed, P.K. (1998). Culture and Climate for Innovation, *European Journal of Innovation Management*,Vol. 1, No. 1, pp.30-43.

Aitken, M. & Hage, J. (1971).The organic organization and innovation. *Sociology*, Vol.5, No.1, pp.63 -82.

Alder, H. (1994). The Technology of Creativity: The brain hemispheres, and how practical techniques can be utilized in harnessing them in business applications. *Management Decision*, Vol. 32, No.4, pp. 23-29. © MCB University Press Limited, 0025-1747.

Amabile, T.M. (1996). *Creativity in Context*, Westview Press, New York, NY.

Amabile, T.M. (1997). Motivating creativity in organizations: on doing what you love and loving what you do. *California Management Review*, Vol. 40, No. 1, pp. 39-58.

Cameron, K.S. & Quinn, R.E. (1999). *Diagnosing and Changing Organizational Culture*, Addison-Wesley, Reading, MA.

Checkland, P. (2000). *Systems Thinking: Systems Practice*, Wiley, London.

Chomsky, N. (1959). Review of Skinner's verbal behaviour. *Language*, 35, 26-58.

Chomsky, N. (1968). *Language and Mind*. New York: Harcourt Brace Jovanovich.

Cooper, R.G. (1983). A process model for industrial new product development. *IEEE Transactions on Engineering Management*, Vol. 8, pp.124 -35.

Czarniawska, B. (1998). *A Narrative Approach to Organization Studies*. Qualitative Research Methods Series No. 43, Sage, London.

Davison, G. (2005). Configured for innovation: the case of palliative care. *European Journal of Innovation Management*, Vol.8, No.2,pp.205-226.

Dikmen, I., M., Birgonul, M.T., and Urtuk, S.U. (2005). Integrated Framework to Investigate Value Innovations. *Journal of Management in Engineering*, Vol.21, No.2, April, © ASCE, ISSN 0742-597X/2005/2-81-90.

Dunphy, S.M. & Herbig, P. (1994). Comparison of Innovative Capabilities among the Anglo-American Countries: The Case for Structural Influences on Innovation. *Management Decision*, Vol. 32, No. 8, pp. 50-56. © MCB UP Limited, 0025-1747.

Foster, G.M. (1962). *Traditional Cultures*, Intercultural Press, New York, NY.

Furth, H. (1971). Linguistic deficiency and thinking: Research with deaf subjects 1964-69. *Psychological Bulletin*, 75,58-72.

Grant, D., Keenoy, T. and Oswick, C. (2001). Organizational Discourse: key contributions and challenges. *International Studies of Management and Organization*, Vol. 20, No. 3, pp. 5-24.

Gross, R. (2001). Psychology: The Science of Mind and Behavior. 4th ed., Hodder & Stoughton, ISBN 0-340- 79061-X.

Hage, J. & Dewar, R. (1973). Elite values versus organizational structure in predicting innovation. *Administrative Science Quarterly 18*, pp.279-290.

Herskovits, E. (1989). *Man and His Works*, Knopf, New York, NY.

Hofstede, G. (1980). *Culture's Consequences: International Differences in Work-related Values*, Sage Publications, Beverly Hills,CA.

Holden, N.J. (2002). *Cross-cultural Management: A knowledge Management Perspective*, Pearson Education, Harlow.

Johnson, M.M. (1996). Finding creativity in a technical organization. *Research Technology Management,* Vol. 3a, No.5, pp.9-11.

Knox, S. (2002). The boardroom agenda: developing the innovative organization. Corporate Governance, Vol.2, No.1, pp.27-36. © MCB UP Limited, 1472-0701,

Kottak, C. P. (1991). Anthropology: The Exploration of Human Diversity. 5th Edition, McGraw-Hill, INC., ISBN 0-07-035616-5.

MacKinnon, D.W. (1960). Genvs architectvs creator varietas Americanvs. *AIA Journal*, September, pp.31-5.

MacKinnon, D.W. (1962). The nature and nurture of creativity talent. *Psychological Review*, Vol. 69, pp.220-32.

Man, J. (2001). Creating Innovation, *Work Study*, Vol.50, No.6,pp.229-233, © MCB University Press. ISSN 0043 – 8022.

Martins, E.C. & Terblanche, F. (2003). Building organizational culture that stimulates creativity and innovation. *European Journal of Innovation,* Vol. 6, No.1,pp.64-74, © MCB UP Limited. ISSN 1460-1060, DOI 10.1108/1460310456337.

McCrae, R.R. (1987). Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology*. Vol. 52, No. 6, pp.1258-65.

McCrone, J. (1999). Left brain, right brain. *New Scientist*, 165(2222), 22-27.

Mednick, S.A. (1962). The associative basis of the creative process. *Psychology Review*, Vol. 69, pp. 484-95.

Miroshnik, V. (2002). Culture and international management: a review. *Journal of Management Development*. Vol.21, No.7, pp.521-544. © MCB UP Limited, 0262-1711.

Morgan, C.T., King, R.A., Weisz, J.R., and Schopler, J. (1986). *Introduction to Psychology*. 7th ed., McGraw-Hill International Editions.

Moss Kanter, R. (1984). *The Change Masters Innovation and Entrepreneurship in the American Corporation*, Simon & Schuster, New York, NY.

Narayanan, V.K. (2001). *Managing Technology and Innovation for CompetitiveAdvantage*. Prentice Hall Inc., Upper Saddle River, New Jersey. ISBN 0-13-030506-5.

Ornstein, R. (1986). The Psychology of Consciousness. 2nd ed., Harmondsworth: Penguin.

Paulus, P.B. (2000). Groups, teams, and creativity: the creative potential of idea-generating groups. *Applied Psychology: An International Review*. Vol. 49, No. 2, pp. 237-62.

Pech, R. & Slade, B. (2004). Memetic engineering: a framework for organizational diagnosis and development. *The Leadership & Organizational Development Journal*, Vol. 25, No. 5, pp. 452-465. © Emerald Group Publishing Limited. 0143-7739. DOI 10.1108/01437730410544764.

Pérez-Bustamante, G. (1999). Knowledge management in agile innovative organizations. *Journal of Knowledge Management*, Vol.3,No.1,pp.6-17, ©MCB UP.ISSN 1367 – 3270.

Pheysey, D.C. (1993). *Organizational Cultures: Types and Transformations*, Routledge, London.

Poolton, J. & Ismail, H. (2000). New developments in innovation. *Journal of Managerial Psychology*, Vol.15, No.8, pp.795-811. © MCB UP, 0268-3946.

Rigg, C. (2005). "It's in the way they talk" A discourse analysis of managing in two small businesses. *International Journal of Entrepreneurial Behaviour & Research*, Vol. 11, No. 1, pp. 58-75. © Emerald Group Publishing Limited 1355-2554.

Roach, T. (1994). "Ancient ways guide modern methods", IDRC Reports, Vol.22, No.2,pp.9-10.

Robbins, S.P. (1996). *Organizational Behavior: Concepts, Controversies, Applications*, 7th ed., Prentice-Hall, Englewood Cliffs, NJ.

Rogers, E. (1995). *Diffusion of Innovations*. 4th Ed. New York: The Free Press.

Rogers, E. M. (1983). *Diffusion of Innovations*, Free Press, New York, NY.

Rosch, E. (1973). Natural categories. *Cognitive Psychology*, 4, 328 – 350.

Rothwell, R. & Wisseman, H. (1986). Technology, Culture, and Public Policy. *Technovation (Netherlands)*, Vol. 4, No. 2, pp. 91-115.

Sapir, E. (1929). The study of linguistics as a science. *Language*, 5, 207-214.

Schumpeter, J.A. (1950). *Capitalism, Socialism and Democracy*. New York: Harper & Row.

Schuster, F.E. (1986). *The Proven Connection between People and Profits*. Wiley, New York, NY.

Shaughnessy, T. W. (1988). Organizational culture in libraries: some management perspectives. *Journal of Library Administration*, Vol. 9, No. 3, pp. 5-10.

Syrett, M. & Lammiman, J. (1997). The art of conjuring ideas, *Director*, Vol. 50, No. 9, pp. 48-54.

Tushman, M.L. & O'Reilly, C.A. III (1997). *Winning through Innovation: A Practical Guide to Leading Organizational Change and Renewal*, Harvard Business School Press,Boston, MA.

Tylor, E.B. (1977). *Primitive Culture: Researches Into Development of Mythology, Philosophy, Religion, Language, Arts and Customs.* Vol.1, Murray, London.

Vernon, M. (1967). Relationship of language to the thinking process. *Archives of General Psychiatry*, 16, 325-333.

Watson, J.B. (1913). Psychology as the behaviourist views it. *Psychological Review*, 20, 158-177.

Watson, T. (2000). Discourse and organization. *Human Relations*, Vol. 53, No. 4, pp. 559-74.

Whorf, B. L. (1956). *Language, thought and reality*. New York: Wiley.

Woodman, R.W., Sawyer, J.E. and Griffin, R.W. (1983). Toward a theory of organizational creativity. *Academy of Management Review*, Vol. 18, No. 2, pp. 293-321.